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ABSTRACT

Reviewed were 28 research studies which investigated the effect of perceptual-motor programs on the reading achievement of students with average or higher intellectual ability. Despite possible criticisms of some investigations, all studies reviewed were reported to acquaint the reader with the range of available research literature. Of the studies reviewed, 12 investigations supported the hypothesis that perceptual-motor development programs enhance reading achievement. The reviewer concluded that the effectiveness of perceptual-motor development programs in improving reading ability can neither be confirmed nor denied. In general, perceptual-motor programs employing a wide variety of experiences appear to show promise with underachieving intermediate-grade students and preschool children. The effectiveness of Delacato- and Frostig-type programs is doubtful. The inclusion of individualized perceptual-motor programs for kindergarten and primary-grade children in physical education classes is developmentally appropriate. Perceptual-motor development provides a medium for self-concept enhancement. A 40-item bibliography is included. (Author/WB)

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PERCEPTUAL-MOTOR DEVELOPMENT AND READING*

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During the past decade the names of Barsch,(1) Bradley,(2) Delacato,(3) Frostig,(4) Getman,(5) and Kephart (6) have become widely recognized in education. The common denominator among these individuals is the role of each in the development of perceptual-motor programs which, in one form or another, have been used in the attempt to enhance reading competency. This presentation will provide an overview of perceptual-motor development theories, a review of pertinent research and explore the present and future role of perceptual-motor development programs.

Perceptual-Motor Development

Approaches to perceptual-motor training are neither new as evidenced by the work of Montessori(7) nor non-controversial as indicated by the debate over Delacato's(8) position. The basic premise of perceptual-motor programs is that the quality of the perceptual and cognitive processes is dependent upon the quality of motoric development. The individual must develop awareness of

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self and environment in a spatial-temporal context in order to be an efficient learner.

The most prolific proponent of perceptual-motor development is Kephart.(6) "Perceptual difficulties", according to this position, "arise when the child's internal structure is missing, incomplete, or distorted." Without internal awareness the child encounters difficulty in processing and acquiring knowledge of the external world of symbols and concepts. While the course of natural development enhances internal awareness of most children, in all too many instances environmental desperation or trauma to the central nervous system may cause perceptual-motor disabilities. By providing a variety of motor activities arranged in a normal developmental sequence an awareness of movement capabilities of the body parts is achieved. This motor base allows the child to focus on the goal of a motoric pattern rather than the mechanics of the movement itself. The term perceptual-motor match is used by Kephart to explain the process whereby perceptual input becomes associated to a structured motoric pattern and the result is structure for the input.

Through the interaction of child and environment via movement and the struggle of postural alignment against the pull of gravity, laterality and verticality are developed. Laterality is an internal awareness of sidedness of the body and verticality is awareness of up and down. These components are elements of the child's

internal reference system for relating to the environment. Temporal and spatial awareness allow the structuring of "nowness" in relation to time and space. Completion of this reference system enables the child to process input, give it structure and to derive meaning from it. Remedial programs of perceptual-motor development have the goal of assisting children structure the internal and external worlds in a spatial-temporal context through activities which contribute to the motor base and the perceptual-motor match.

Perceptual-motor activities vary in nature from large-muscle locomotor activities to ocular-motor pursuit tasks. Categorization of perceptual-motor activities yield at least 10 headings based on area of development. (8,9) These activities and the area of contribution of each is as follows:

1. Body image	Perception of the body and its parts in space and the ability to control its function.
2. Balance	Maintenance of a position of equilibrium of the body or objects.
3. Basic movements	Differentiation and coordination of movement for efficient posture and locomotion.
4. Eye-hand and eye-foot coordination	Integration of visual information with gross or fine motoric responses of the hand or foot.

5.	Form Perception	Recognition of visual shapes and symbols and figure-ground discrimination.
6.	Ocular-motor coordination	Control and effective movement of the eyes.
7.	Hearing discrimination	Recognition of sound, sound sequences, and place of origin of sound.
8.	Drawing and writing readiness	Differentiation of body parts leading to control of fine movements of the wrist and fingers.
9.	Speech readiness	Differentiation and control of the lips, tongue, and oral cavity in order to make meaningful sounds.
10.	Games, rhythmics and exercises	Strength, coordination and control of the body or its parts in gross or fine movements incorporating structured or creative patterns.(8)

The spectrum of perceptual-motor activities is wide and the opportunities for student success experiences are limitless.

Research Findings

Twenty-eight research studies were reviewed which investigated the effect of perceptual-motor programs on the reading achievement of students with average or higher intellectual ability. Despite possible criticisms of some investigations, all studies reviewed were reported in order to acquaint the reader with the range of available research literature.

Supporting Studies

Twelve investigations supported the hypothesis that perceptual-motor development programs enhance reading achievement. Underachieving boys ages eight to eleven were found by Hagin, Silver, and Hersh (10) to have made significant improvement in measures of perception and reading when compared to a control group. Wharry using nine to eleven year old boys, who were behind in reading, found a combination of perceptual-motor activities and reading instruction to be superior to reading instruction alone.

A pilot study by Lewis (12) reported significant improvement in motor-coordination and reading for eight second grade boys who were one year behind in reading achievement. This study, however, did not have a control group. Swanson (13) found that lower socio-economic second graders made greater improvement in word recognition as a result of perceptual-motor training and reading as compared to only reading instruction.

Two studies by McCormick and his associates (14,15) cited gains in reading for first graders. The program consisted of perceptual-motor activities, phonics, and forced attention by loud auditory stimulation. The first study found significant differences for twelve students who scored below the 30th percentile in reading readiness but not the total group. The second study involved underachievers and it was concluded that academic achievement was enhanced. The Dayton Public School System (16)

reported that a perceptual-motor program inproved reading skills for both slower and faster learning first graders.

The studies involving preschool children included an investigation by Faustman (17). Superior gains in perceptual and reading abilities were achieved by students participating in a combination of Frostig, Strauss and Kephart type activities. Lazroe (18) found significant improvement in reading for boys and girls, older and younger children, as well as the high and low mental age subjects. A program of rhythmics and sensori-motor activities of the Barsch and Kephart type were used by Painter (19) to achieve superior gains in body image, perceptual-motor integration, and psycholinguistic competency. Rutherford (20) found a Kephart program to be effective for boys but not girls in enhancing reading and total readiness.

An investigation by the New Jersey State Department of Education (21) followed 275 primary grade children over a three year period. The experimental and control subjects were similar, except the former were one year behind in reading. After one year the control group continued to perform significantly higher on academic tests. At the end of the second and third years no significant differences between the two groups were found. It was noted that the children receiving perceptual-motor training "appeared to have the faster growth rate" and "slower children seemed to have benefited from the special training, whereas the other children generally had not".

Research Refuting Perceptual-Motor Programs

A Kephart program was used by Roach (22) with children whose average age was ten and one half years. When compared to a control group no significant gains in oral reading were reported. Anderson,(23) Foster,(24) and O'Donnel(25) investigated the influence of Delacato type programs on intermediate, fourth and fifth, and second through fourth grade students respectively. No true differences among any of the groups in reading achievement were found. Foster (24) used a unique design which incorporated a group receiving Delacato suggested therapy and a group participating in activities diametrically opposed to this position. The Delacato group did not achieve greater gains and the "opposite" group did not regress as was hypothesized.

Delacato techniques were also used by Robbins(26) with second graders. Like the other studies using this program no real improvement in either laterality or reading was attained. Duggan (27) divided 30 second graders among the following groups: 1) motor-skill, 2) motor-skill and reading, 3) visual-perception and reading, and 4) reading instruction. No differences were reported however, only the special motor-training group made improvement, at the .01 level of probability in motor performance, perceptual performance and reading achievement.

Brown,(28) Emmons,(29) La Pray and Ross,(30) and O'Connor (31) used perceptual-motor programs of the Kephart or Getman-Kane type with first graders. Brown(28) found improvement in

some measures of visual perception but not reading, as did La Pray and Ross(30). Emmons(29), while reporting that perceptual-motor training may be helpful for slow learners, concluded that perceptual-motor training does not enhance reading ability of beginning readers. Differences in internal awareness but not reading were found by O'Connor(31) when comparing perceptual-motor and physical activity groups. Arciszewski(32), Jacobs,(33) and Rosen(34) investigated the effectiveness of the Frostig program. The latter study(34) devoted fifteen more minutes of reading instruction for the control group whereas the experimental group engaged in fifteen minutes of Frostig activities: No differences were found when these groups were compared. Arciszewski(32) compared Frostig, phonics and basal reader groups and found the Frostig group no higher in perception or reading achievement at the end of the study. Preschool, kindergarten and 1st grade students were subjects in Jacob's(33) study. The Frostig program was followed for one academic year and some differences were reported in favor of the experimental group on the Frostig Test of Visual Perception but no differences in reading were reported.

With kindergarten children Anderson(23) and Stone and Prelstick(35) used Delacato neurological development techniques and failed to enhance reading readiness. Meyerson(36) in a study using perceptually handicapped subjects participating in a Kephart type program reported no differences in reading in comparison to a control group. In a summer program to foster visual-motor and

auditory skills, Wingert(37) found that visual-motor abilities, as measured by the Frostig test, can be developed. Moreover, the gains remained after three months but differences in reading readiness were not evident.

CONCLUSIONS AND IMPLICATIONS

The effectiveness of perceptual-motor development programs in improving reading ability can neither be confirmed nor denied. In general, perceptual-motor programs employing a wide variety of experiences appear to show promise with underachieving intermediate grade students and preschool children. The effectiveness of Delacato and Frostig type programs is doubtful.

Reading teachers have an enormous responsibility in helping students develop reading skill. Instruction in reading by a teacher who is humanistic, sensitive to student needs, and has positive expectancies for the individual is an important part of an effective school program. The realization of individual differences(that all students do not have the same experiential background, learn by the same modes, or learn at the same rate) lends to openness concerning new methods. Reading instruction may be paramount to the development of reading adequacy but sometimes other learning experiences assist in achieving the desired outcome.

The inclusion of individualized perceptual-motor programs for kindergarten and primary grade children in physical education

is developmentally appropriate. Moreover, perceptual-motor development provides a medium for self-concept enhancement. Research (18,19,38) has demonstrated that perceptual-motor activities improve generalized body-image development of children. This is an important contribution as evidence indicates that reading achievement is related to positive self-concept(39). In addition, children with learning disabilities are characterized by inadequate impulse control, poor perceptual and conceptual integration and defective self-concept(40). Therefore, it is wise to consider activities which help children develop positive self-concepts before helping them in becoming successful readers.

Professors of reading and physical education in college and university teacher education programs are remiss if they fail to develop in prospective teachers the attitude of cooperation and mutual responsibility for the total development of children. In this respect, perceptual-motor development programs are not intended to be a substitute for reading instruction, but a supplement to enhance academic enjoyment and competency.

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